SWIMMING POOL HEAT PUMP

Installation & Instruction Manual

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Number	Item	Model /Size
DS-31	compressor(WPH40)	C-RN-220H5B
DS-32	compressor(WPH45)	C-SCN261H5A
DS-33	compressor(WPH50)	C-SBN301H5A
DS-34	compressor(WPH60L)	C-SBN371H5A
DS-35	compressor(WPH60)	JT170GBBY1L
DS-36	heat exchanger(WPH15)	1050-0015-1
DS-37	heat exchanger(WPH20)	1050-0002-1
DS-38	heat exchanger(WPH30)	1050-0003-1
DS-39	heat exchanger(WPH40,45)	1050-0004-1
DS-40	heat exchanger(WPH50)	1050-0005-1
DS-41	heat exchanger(WPH60L,60)	1050-0006-1
DS-42	quick fitting(of drip tray)	4'to 16mm
DS-43	water union	50mm
DS-44	water union	1 1/2"
DS-45	off-season waterproof cover(for WPH15,20)	OP-01-A
DS-46	off-season waterproof cover(for WPH30,40,45)	OP-01-B
DS-47	off-season waterproof cover(for WPH50,60,60L)	OP-01-C
DS-48	waterproof box(for controller)	OP-02
DS-49	drip tray	OP-03
DS-50	fan blade	Ø490
DS-51	drain valve	4'inner screw
DS-52	8-pin cyber cable (each meter)	cc-8p
DS-53	6-pin cyber cable (each meter)	cc-6p
DS-54	phase protector (WPH60)	EWS
DS-55	sealing rubber	

Note:the parts written in italic letters are not universal.

6.2 Acknowledgement

Thank you for choosing our swimming pool heat pump!
If you have any question, please contact with the local distributor.

1. 0 General information

1.1 Introduction

This manual provides installation and operation instructions for the heat pumps .Read these installation and operation instructions carefully before proceeding with the installation. Consult the local distributor with any questions regarding this equipment .Please read this manual carefully before you install. Start, repair or maintain the unit. Installation and service must be performend by a qualified installer.The manufaturer shall not be responsible for any damage of the unit or physical injury or death caused by improper installation,debugging, operation,maintenance or disregarding the manual.

1.2 Consumer Information and Safety

a. We recommend 80°F (27°C)as the optimun water temperature for swimming. Overheated water may cause tiredness and reduce comfort of swimming.
b. The drinking of alcoholic beverages before or during spa or hot tub use can cause drowsiness which could lead to unconsciousness, and subsequently result in drowning.
c. ***Pregnant women take note!*** Soaking in water above 102°F(38.5°C) can cause fetal damage during the fi rst three months of pregnancy (which could result in the birth of a brain-damaged or deformed child). If pregnant women are going to use a spa or hot tub, they should make sure the water temperature is below 100°F (38°C) maximum.
d. The water temperature should always be checked with an accurate thermometer before entering aspa or hot tub.
e. Persons with a medical history of heart disease, diabetes, circulatory or blood pressure problems should consult their physician before using a hot tub or spa.
f. Persons taking any medication which induces drowsiness (e.g., tranquilizers, antihistamines, or anticoagulants) should not use spas or hot tubs.
g. Prolonged immersion in hot water can induce hyperthermia.

1.3 Energy Saving Tips

It is important to note that a heat pump will not heat a pool as fast as a large gas or electric pool heater. If the pool water is allowed to cool significantly, it may take several days to return to the desired swimming temperature. For weekend use, it is more economical to maintain the pool water temperature at or near your desired swimming temperature. If you do *not* plan to use your pool for a prolonged period, then you might choose to turn the heat pump completely off *or* decrease the temperature setting of the control several degrees to minimize energy consumption.

a.Use an accurate pool thermometer. A difference of 4°F(2°C) , between 78°F and 82°F (26°C and 28°C), will significantly increase energy consumption.
b. Carefully monitor the water temperature of your pool in the summer time. You can reduce heat pump usage due to warmer air temperatures.
c. During the winter or when on vacation for longer than a week, turn off the heat pump.
d. Find the proper setting on the heat pump temperature control
e. Where possible, shelter the pool from prevailing winds with well-trimmed hedges or other landscaping, cabanas, or fencing.
f. Always use a pool cover when practical. Besides providing a valuable safety feature, a pool cover will reduce heat loss.

2.Specifications

2.1 Technical specifications of VA-WPH models

Item/type		Unit	VA-WPH15	VA-WPH20	VA-WPH30	VA-WPH40
Fan location			TOP			
Heatin capacity	F	BTU/H	37510	42625	44330	57970
		W	11000	12500	13000	17000
	E	BTU/H	24552	32395	35805	54560
		W	7200	9500	10500	16000
Power input	F	W	1320	1900	2730	2750
	E	W	1200	1800	2470	2600
COP	F		6.22	6.58	4.76	6.18
	E		6.0	5.28	4.25	6.15
Current	F	A	6.5	8.7	13.2	14.3
	E	A	5.7	8.2	11.8	13.6
power supply		V/Ph/Hz		220-240/1/50		
Compressor			1set			
			Rotary			
Heat exchanger			Titanium heat exchanger in PVC housing			
Refrigerant			R407C/R22			
Fan amount			1			
Power input of fan		W	175			
Rotate speed		RPM	650			
Noise level		dB(A)	47	47	47	51
Connections		mm	50			
Water flow		m^3/h	2.2	3	4.5	6
Water pressuredrop		kPa	10			
Dimensions		mm	575*575*680	575*575*680	575*575*780	575*575*780
Package size		mm	710*710*820	710*710*820	710*710*920	710*710*920
N.W/G.W		kg	54/68	58/72	64/78	75/90

Item/type		Unit	VA-WPH45	VA-WPH50	VA-WPH60L	VA-WPH60
Fan location			TOP			
Heatin capacity	F	BTU/H	63085	68200	92070	92070
		W	18500	20000	27000	27000
	E	BTU/H	58652	61380	85250	85250
		W	17200	18000	25000	25000
Power input	F	W	3300	4300	5100	6000
	E	W	3100	3750	4700	5500
COP	F		5.61	4.65	5.32	4.50
	E		5.55	4.80	5.29	4.55
Current	F	A	15.8	22.5	24.0	10.3
	E	A	15.0	19.5	22.2	9.7
power supply		V/Ph/Hz	220-240/1/50			380/3/50
Compressor			1set			
			Scroll			
Heat exchanger			Titanium heat exchanger in PVC housing			
Refrigerant			R407C/R22			
Fan amount			1			
Power input of fan		W	175			
Rotate speed		RPM	650			
Noise level		dB(A)	54	56	58	58
Connections		mm	50			
Water flow		m^3/h	6.0	3	4.5	6
Water pressuredrop		kPa	12			
Dimensions		mm	575*575*780	575*575*880	575*575*880	575*575*880
Package size		mm	710*710*920	710*710*1020	710*710*1020	710*710*1020
N.W/G.W		kg	88/103	98/113	100/115	102/117

F-factory test conditions	E-european test conditions
surrounding temperature:24℃db/19℃ wb	surrounding temperature:15℃ db/11℃ wb
27℃entering water	27℃entering water
COP: 4.5-7.0	COP: 4.0-6.1

Note:the above data are for your reference. There will be no prior notice for technical improvement

6. Appendix

6.1 Spare Parts List

Number	Item	Model /Size
DS-01	controller	ver1.0
DS-02	controller	ver2.5
DS-03	PCB	ver1.0
DS-04	PCB	ver2.5
DS-05	water flow switch(WPH15,20,30)	reset at 2.5~3.0 m^3/h
DS-06	water flow switch(WPH40,45)	reset at 5.5 m^3/h
DS-07	water flow switch(WPH50,60L,60)	reset at 7.0 m^3/h
DS-08	water temp.sensor (ver1.0)	M6screw,50 kΩat 25℃
DS-09	water temp.sensor (ver2.0)	M8screw,50 kΩat 25℃
DS-10	defrost sensor	50 kΩat 25℃
DS-11	fan motor capacitor	5μF/450v
DS-12	compressor capacitor(1for WPH15,2for WPH60L)	35μF
DS-13	compressor capacitor(1for WPH20)	50μF
DS-14	compressor capacitor(1for WPH30)	55μF
DS-15	compressor capacitor(1for WPH40,45)	40μF
DS-16	compressor capacitor(1for WPH50)	60μF
DS-17	compressor capacitor(1for WPH50,60L)	98μF
DS-18	relay(WPH15,20,30)	JQX-105F-4/220AK1H
DS-19	contactor(WPH40,45,60L)	LC1-D2510M7N
DS-20	contactor(WPH40,45,60L,60)	LC1-D0910M7N
DS-21	high pressure switch	3.0/2.4
DS-22	transformer	GB4126(CE/TY300002.01)
DS-23	pressure gauge	Y-60
DS-24	4-way reversing valve(WPH15,20)	STF-0201
DS-25	4-way reversing valve(WPH30,40,45)	SHF-9-45U-G
DS-26	4-way reversing valve(WPH50,60L,60)	STF-0401
DS-27	fanmotor	YYK60B-6A
DS-28	compressor (WPH15)	CSL211CV-C7LU
DS-29	compressor (WPH20)	CHY33MC4-U
DS-30	compressor (WPH30)	CHV33YC6-U

5. Maintenance and Trouble shooting

5.1 Maintenance

General Maintenance:

a.The unit should be maintained twice a year by qualified technicians. If the unit is located in coastal area, more frequent maintence is necessary.

b.A professional technician should clean the unit periodically. Tt is NOT recommended to use a sprinkler to flush the unit.

c.The unit is designed to withstand only normal rainfall.A flow of water entered into the internal of the unit may damage the components. If the unit is located under the eaves, span a water guide to prevent water flow falling into the unit.

4.Clean the drain hose.

Keep proper water flow:

a.Keep the filter clean. The filter may get dirty along with using.Adirty filter can re duce the water flow .

b. Keep the pump clean, too.

c.Check the valves often.

5.2Troubleshooting

The unit would not run:

a.Is the screen of control panel lit? If ont, make sure the electrical wires and cables are correctly connected and the power is on.

b. If the screen displays “E7”,check the water flow. Whether the water pump is running normally or the filter is jammed?

c.The unit will stop running automatically when the pool water reaches the set temperature

The unit is running but not heating:

a. Is the air discharged from the fan cooler than the ambient temperature?If not, ask a professional technician to check the refrigerant system.

b.Be sure the space around the unit is broad enough.There should not be obstruction of air.

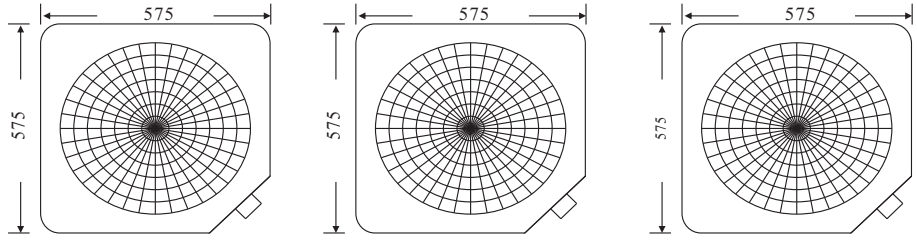
c.The unit will defrost when the ambient temperature is lower than normal condition (usually when the temperature is lower than8 .

2.2 Dimensions

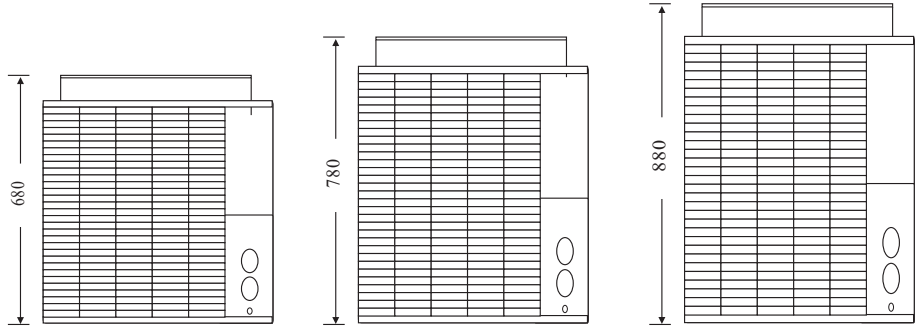
VA-WPH15
VA-WPH20

VA-WPH30
VA-WPH40
VA-WPH45

VA-WPH50
VA-WPH60L
VA-WPH60



Planf orm



Side view

3.0 Installation

3.1 General information

Inspect the casing,unit and spare parts after receipt for possible for possible damage in transportation. Check whether there is breakage of the casing and cabinet, deformation of the unit,shed parts.The manufacturer shall not be responsible for any damage due to improper hanging or shipping.

Install the heat pumps in accordance with the procedures in this manual, lacal codes and ordinances.

Correct installation is required to assure safe operation.The requirements for heat pumps include the following:
a.Appropriate site location and clearances.
b.Sufficient air ventilation.
c.Proper electrical wiring.
d.Adequate water flow.
This manual provides the information needed to meet these requirements . Review all application and installation procedures completely before continuing the installation.

3.2 Location

The unit should be usually installed outdoor (NOTE: Indoor installations require special considerations for condensate drainage and venting the cold air produced by the heat pump.)
Install the unit downstream of all pumps and filters and upstream of all chlorinators,ozonizers and chemical pumps.
Keep lawn sprinkler heads from spraying on the heat pump to prevent corrosion and damage .Use a deflector if needed.
Make sure the heat pump is not located where large amounts of water may run-off from a roof into the unit. Sharp sloping roofs without gutters will allow massive amounts of rain water ,mixed with debris from the roof to be forced through the unit. A gutter or down spout may be needed to protect the heat pump.

4.3 Error Code

Code	Explanation
E0	Phase failure(only for 3 phase unit)
E1	Compressor overload
E2	HP protection
E3	Water flow switch protection
E4	LP protection
E9	Communication failure
F30	Defrosting sensor short circuit
F31	Defrosting sensor open
F20	Condensing sensor short circuit
F21	Condensing sensor open
F10	Inlet water temperature sensor short circuit
F11	Inlet water temperature sensor open

Note: all error would stop the heat pump from running. Press"ON/OFF"after removing the error to start it again . Only error E3 can be automatically removed on the condition that the minimum water flow volume is regained.

4.4 Operation Data Setting

The operation data of the unit can be set on the control panel .

meaning	Range	default	Adjust(yes/no)
Return water temperature(heating mode)	16-45℃	27℃	yes

Operation

Format of Short Message:

a) Temperature setting:

Write message in the following format and send it to the SIM card in the SMS control device:

CODE:889988 SET TEMPERATURE:XX.X (889988 refers to password . XX.X refers to set temperature , unit: ℃)

E.g.set temperature is 30.0 ℃,the message should be written as following:

CODE:889988SET TEMPERATURE: 30.0℃

b) turning on the heater:

send the following message to turn on the heater:

CODE:889988OPEN

c) turening off the heater:

send the following message to turn on the heater:

CODE:889988CLOSE

d) Status check:

send the following message to the SMS control device to check the current status of the heater:

CODE:889988

e) Timing for start and stop:

Send message in the following format to set the turning on/off time:

CODE:889988 POWER ON TIME:DD/MM/YY,HH:SS POWER OFF TIME1:DD/MM/YY,HH:SS

e.g.turning on time is 15:30,23Jan,2008,turning off time 18:50,25Jan,2008. The message should be written as following:

CODE:889988POWER ON TIME:23/01/08,15:30 POWER OFF TIME:25/01/08/,18:50

f) Change Password

Send message in the following format to change the password:

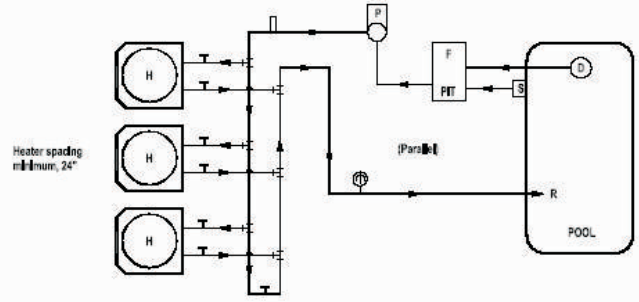
CODE:889988 NEW CODE:XXXXXX(889988: original password;XXXXXX :new password)

☝ Note: there is no space after the punctuations.

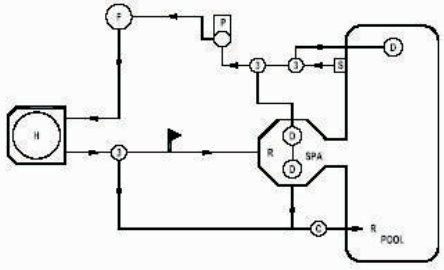
After receiving a message, the SMS indication on the controller screen would light and the heater would automatically send a message to the sender`s mobile phone as a reply.

☝ Note :the SMS control device can treat only one message in each minute. More than one message in a minute can result in jam and worng operation.

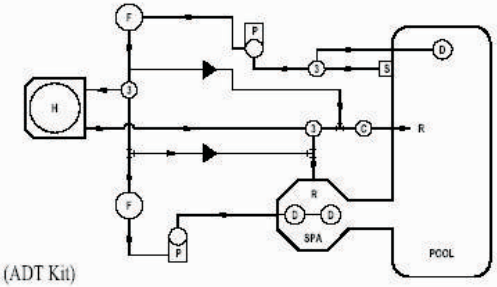
Specification



Multiple Heat Pump Installation



Pool/Spill over Spa - One Pump System



Pool/Spill over Spa - Two Pump System

LEGEND

3 - 3 way valve
C - Chlorinator (if used)
D - Drain
F - Filter
H - Heat pump
P - Pump
R - Return
S - Skimmer

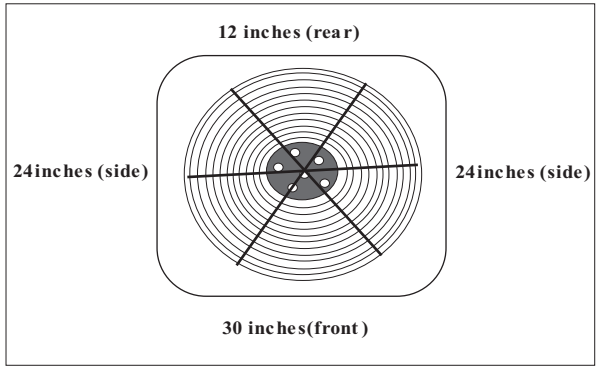
- Flow Switch (ADT Kit)
- Throttle valve
- Thermometer
- By-Pass Check Valve
- Flow meter

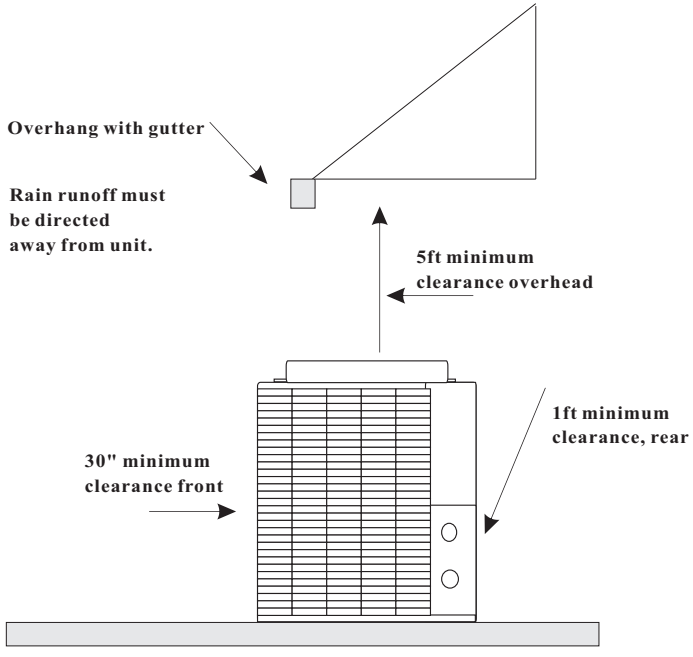
Note: the longer the pipes connecting your pool and the unit ,the more energy is lost.

3.3 Clearances

The unit needs continuous fresh air while running.Please leave enough space around the unit for unobstructed air absorption and discharging. Don't locate the unit in an enclosed area, or the discharged cold air will circuate the unit again and consequently lower the heating efficiency.

Recommended Clearance:




Overhang with gutter
Rain runoff must be directed away from unit.
5ft minimum clearance overhead
1ft minimum clearance, rear
30" minimum clearance front

Pattern l: turn the heater on,press and hold"TIMING"for five seconds to enter the setting for turningon/off date and time, "NOW TEMP"indicating"St1", screen displaying"NO". Press “▲” and “▼” to set and press "TIMING"to shift and confirm the new setting. The screen would display "OFF"once the setting of turning on time is finished. Then set turning off time the same way. The timer indication would be on once the setting of turning on and off timeis finished. Press "MODE"to choose the running mode,and then turn off the heater. The heater would run following the timer.

Pattern ll :after entering setting,press"℃/℉ "to shifr from pattern l to pattern II of timing, screen displaying "St2"instead of "St1". Press “▲”and“▼” to set turning on/off time and press“TIMING”to shift and confirm the new setting. The heater would run according to the setting everyday .

Pattern lll:after shifting from "St1",to "St2",press "℃/℉ " again to enter pattern lll,screen displaying"St3"and "SUN". By pressing“▲”and“▼” and "TIMING" , the user can set desired temperatureof each day in a week . After setting of all days in a week is finished ,the screen would show the setting twoseconds a day for one time. Then the timer indication would be on. Under this pattern please DON`T turn off the unit.

Note :during the process of setting,one press on "ON/OFF"button would result in quitting setting and the newsetting will not be activated.

The above three patterns can`t be activated at the same time. Any of them is activated,the other two are null.

Set temperature can not be changed under pattern lll. Only running mode can be changed.

4.2 Instruction of SMS control

To use SMS control, the following conditions need to be reached:

a) One available SIM card which accords to the GSM is needed.

b) Make sure this card can send and receive SMS without problem.

c) Insert the SIM card in the slot of the SMS control device.

Connect the SMS control device to the controller and the DC power source packed with the heater. The screen of the controller would show the strength of the network signal. Please put the SMS control device where the signal is good enough.

Caution : it`s forbidden to pull out the SIM card when the power of the SMS control device is still on.

◆ **Temperature setting**

Turn the heater on,press "▲" and "▼" to set temperature . The buzzer would make a long beep five seconds later to confirm the new setting.

◆ **Temperature Display Shift**

Press "℃ / ℉" to shift between celsius and fahrenheit display.

Once the heatpump heat the water to 29degree,the compressor and fan motor wouldstop and the circulation pump would go on running for another 10 minutes. At the end of the 10minutes , the water temperature is still bove 27degree with the 10minutes,the heat pump would start to runagain. The user can setthe timing for restart of the water pump.Press "pump"to enter the setting. The clock would show the last setting .Press "▲"and"▼" to set the timing and press"pump"to shift andconfirm the setting(setting range:10-300 minutes,display for water temperature would not refresh during this period).

Note : This function is null with SPA mode (the water pump would not stop running under SPA mode).

◆ **Timing for turning on/off water pump**

Note :this timing is for pool cleaning or summer days when heat pump heat is not needed to run. Heat pump would not once the timing is actived.
Turn on the heat pump,press and hold"pump"for 5 seconds."NOW TEMP"would indicate "SP",screen displaying"SUN"and"ON". Then the user can set the turning on time on Sunday by pressing "▲"and"▼"and"PUMP". Press "PUMP"again to confirm the setting for turning on time on Sunday.Then the screen would display"OFF"insteed of "NO"which allows the user to set the turning off time on Sunday .The screen would display "MON"instead of"SUN"once the turning off time on Sunday is confirmed. In the same way,the user can set the turning on/off time of each day in a week."PUMP" would twinkle once two seconds to indicate that the timing is activated and the user can turning off the heater.

◆ **Date and time adjustment**

Turn the heater on and press"CLOCK"to enter date and time setting.Press "▲" and"▼" to change the set and press"CLOCK"to shift and confirm the new setting.

◆ **Timing for ON/OFF**

3.4 Drainage

While the unit is running water in the air may condense on the fins of the evaporator.If the air humidity is very high,the condensatin water within an hour can be several gallons. The water will flow down to the base plate through the fins. The factory provide optional drip tray to collect the condensation water. Please couple it with a hose to dain the water to a suitable place.

3.5 Electric wiring

General Requirements:

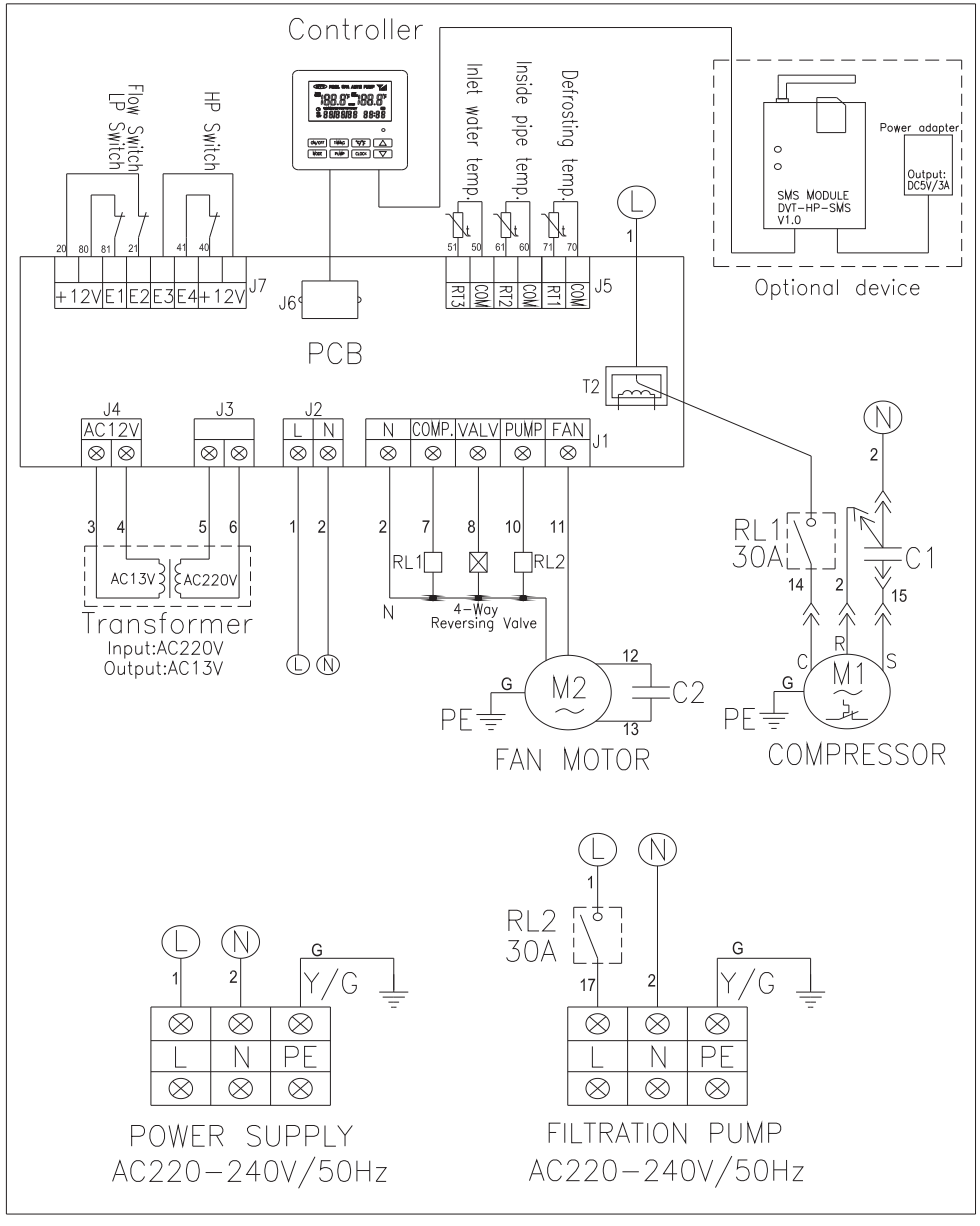
Read the information of the manual befor connecting .**It is compulsively required that the cables should be wired by a qualified electrical technician.** Connection made by be unprofessional people may cause electric shock even death. The manufacturer shall not be responsible for the consequences of connection made by unqualified people or disregarding the manual.

a. No power supplied to the unit while connecting.
b. Always comply with the national and local electrical codes and standards.
c. In case any emergency occurs, the unit must be equipped with a breaker.
d.The unit must be well earthed.

Several screws fix the front board of the cabinet.drive them out and remove the front panel. Mount the front panel after connecting. Make sure that it is fixed firmly by the screws.

Wiring diagram:

Single phase (VA-WPH15 、 VA-WPH20)

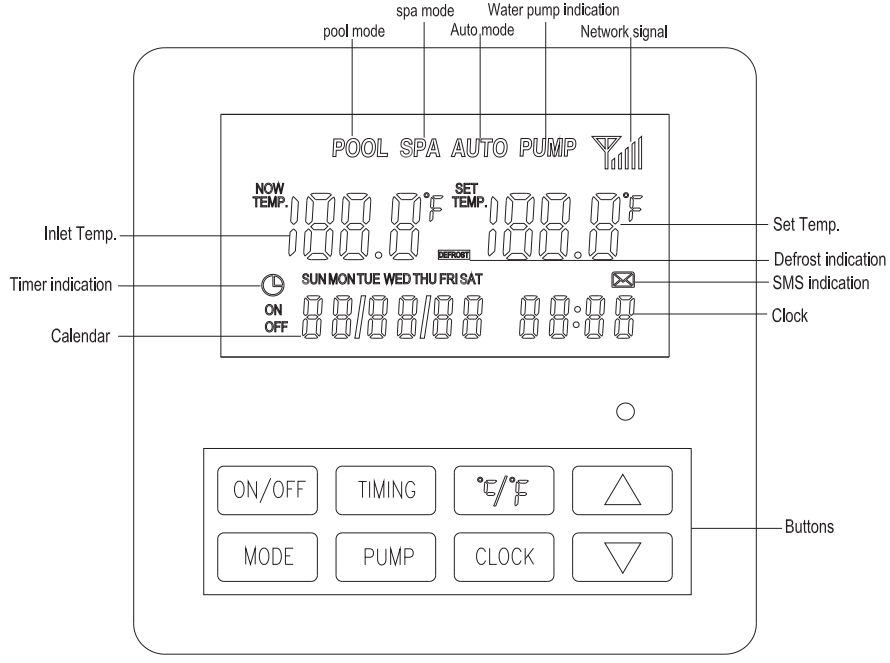


4.Operation

4.1 Ctontrol panel

The control panel can be mounted outdoor or indoor for remote control of the unit.

Buttons and Functions:



◆ **Turn on/off the Heater**

Press "ON/OFF" to turn on or turn off the heater.

Note :In order to protect itself, the compressor would not start within 5 minutes after it stops. If the user would like to start the heater again after turning it off, he should wait for 3 minutes.

◆ **Running Mode Shift**

Turn the heater on,press "MODE" to shift between POOL,SPA and AUTO modes.User can choose the suitable heating mode for the swimming pool (POOL mode,original set temperature 27 ℃)or spa (SPAmode,original set temperature 38℃)in his family. He can also choose AUTO mode to let the heater choose the right mode by learning the temperature rising rate monitored from the water.

3.6 Initial startup

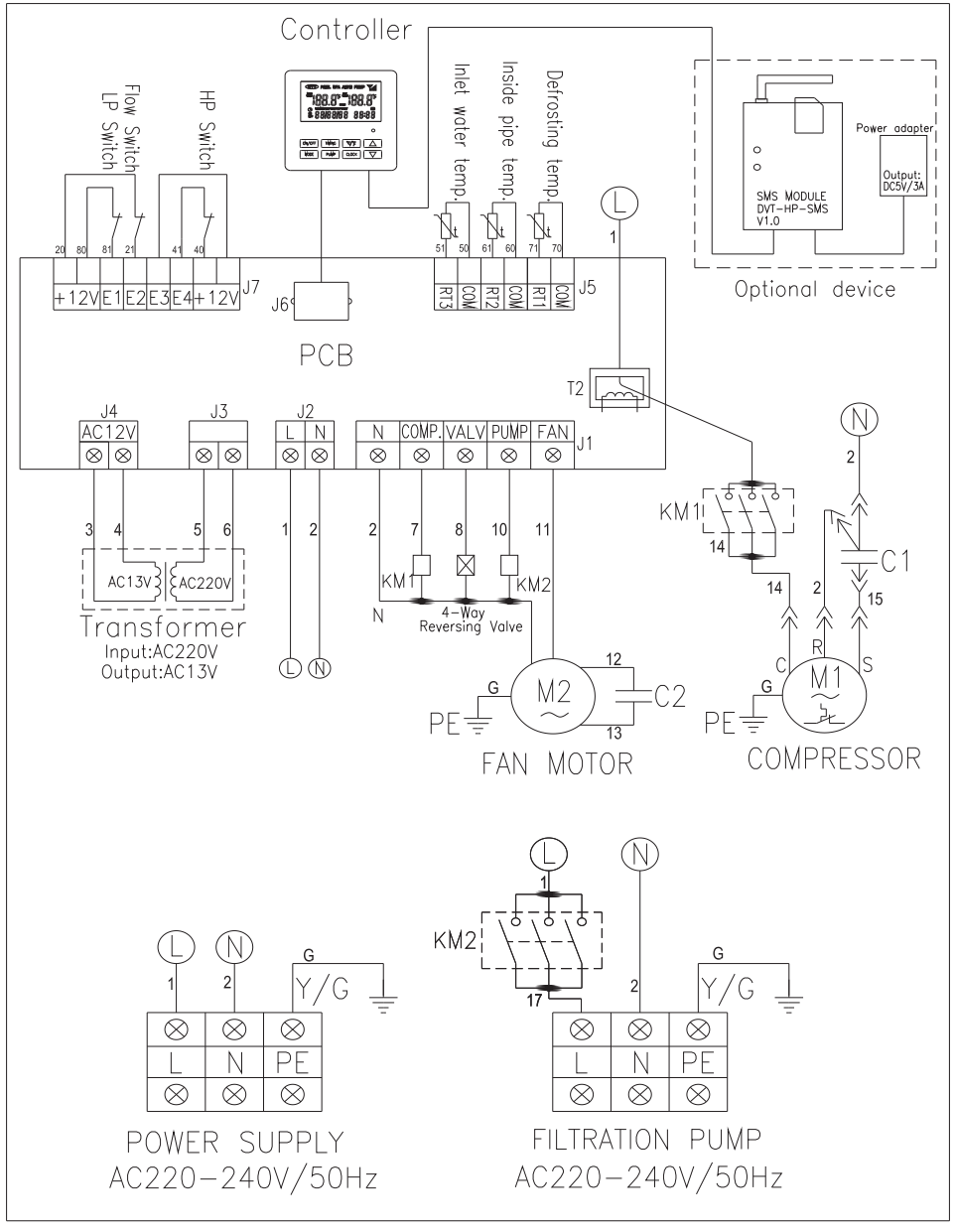
Start the unit after finishing connecting for comprehensive examine and debugging.
With any new pool or spa installation,operate the filter pump with the heat pump off long enough to completely clean the water.This will remove any installation residue from the water.

Notice : the unit will not heat the pool when the water pump is not working.

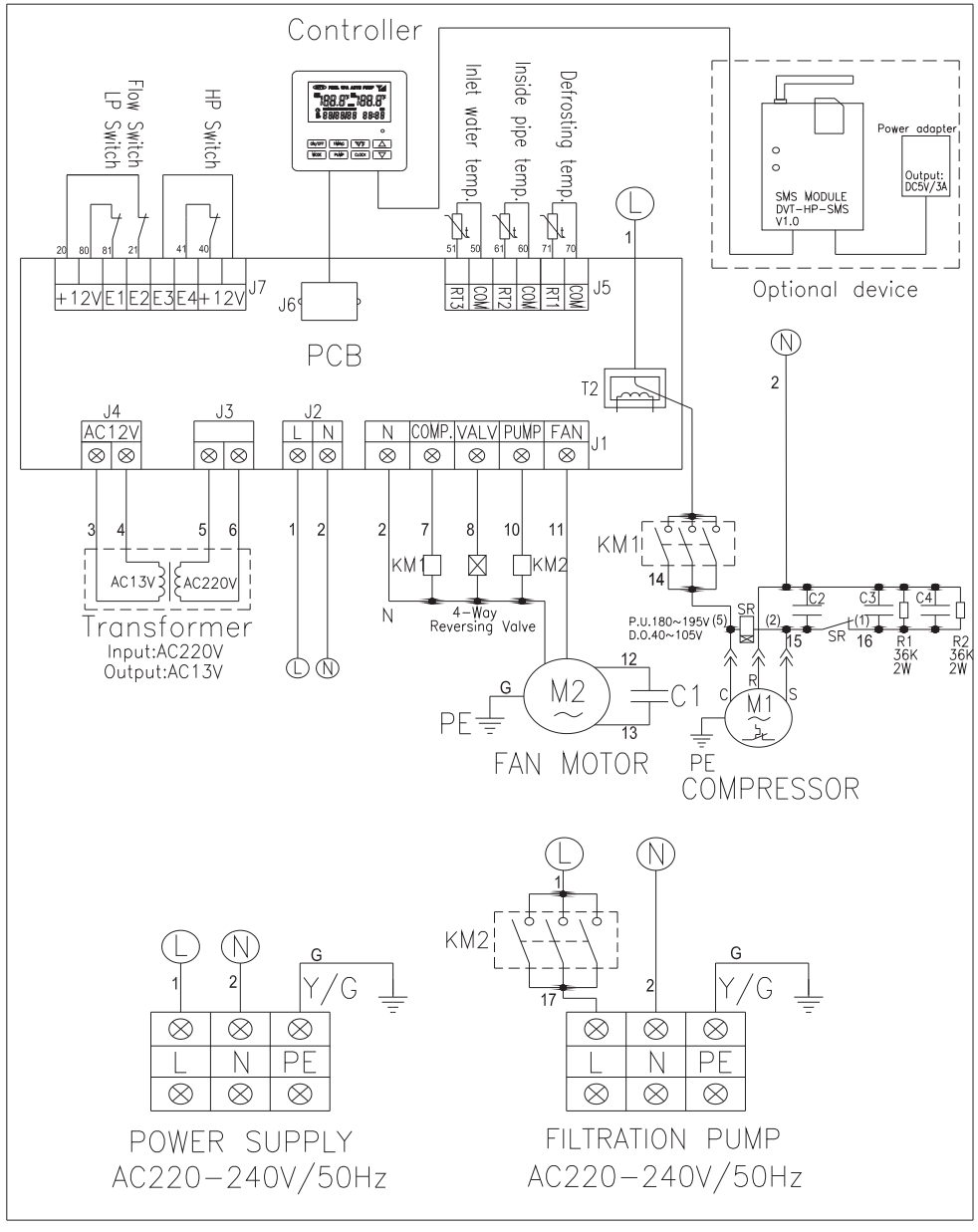
Starting Steps:

a. Check whether the connections, wires and cables of the unit, water pump, chlornator, ozonizer, chemical pumps and control panel are corrctly coupled or connected .
b. Turn on the water pump and filter.Check for water leakage and verify the water flow.
c. Turn on the power of the unit.Then press the button ON/OFFon the control panel. The unit will start in several seconds.
d. After the unit runs for a few minutes, check whether the air discharged from the fan is cooler than the ambient air.
e. Turn the water pump off while the unit is running. The unit should stop working automatically. If not, adjust the flow switch.
f. Turn on the unit again, set the temperature on the cpntrol panel and keep the whole pool system running. The unit will stop running automatically as the pool water reaches set temperature plus 1degree. When the temperature drops to 1℃ lower than the set temperature,The unit will restart automatically.

Single phase VA-WPH30



Single phase （VA-WPH40、VA-WPH45、**VA-WPH50、VA-WPH60L**）



3 phase (VA-WPH60)